NOTES: CC.6.NS.4

Name_____ Date_____

GREATEST COMMON FACTOR

VOCABULARY:

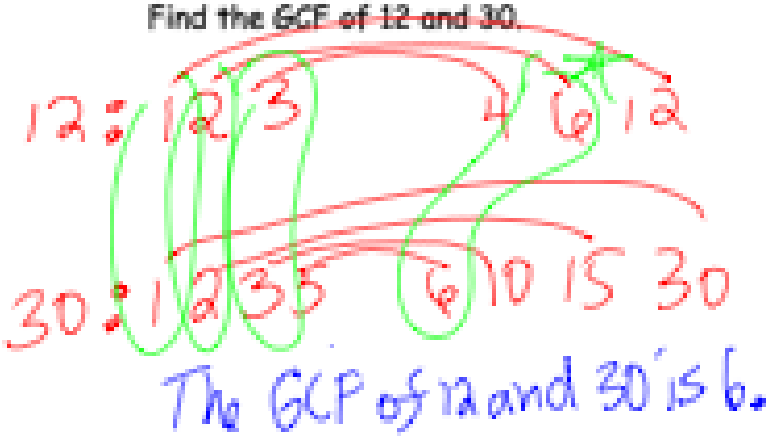
The greatest common factor (GCF) of two whole numbers is the greatest number that is a factor of both numbers.

Two numbers that have a GCF of 1 are called relatively prime.

How Do We Find the GCF of Two or More Numbers?

Method 1: Listing the Factors

Find the GCF of 12 and 30.



Create factor rainbows

STEPS:

1. List the factors of each number.
2. Circle the common factors.
3. The GCF is the greatest factor that is shared by both numbers.

You Try:

Find the GCF of 24 and 40 by listing the factors.

The GCF of 24 and 40 is 8.

numerator $\frac{24 \div 8}{40 \div 8} = \frac{3}{5}$ denominator

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Method 2: Prime Factorization

Find the GCF of 45 and 60.

$45 = 3 \times 3 \times 5$

$60 = 2 \times 2 \times 3 \times 5$

$gcf = 3 \times 5 = 15$

STEPS:

1. Find the prime factorization of each number.
2. Find the product of the common prime factors.

The gcf of 45 and 60 is 15.

You try:

Find the GCF of 24 and 120 using prime factorization.

$24 = 2 \times 2 \times 2 \times 3$

$120 = 2 \times 2 \times 2 \times 3 \times 5$

$2 \times 2 \times 2 \times 3 = 24$

The gcf of 24 and 120 is 24.

Which Strategy to Use?

When is it best to list the factors vs. using prime factorization? Provide two examples – one where listing factors is most suitable and the other when prime factorization is best.

Listing factors is best for smaller values.

Prime factorization is best for larger values.

NOTES A fraction is written in simplest form or simplified if the numerator and denominator are relatively prime.

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Simplifying Fractions

Method 1: Using Birthday Cake

Simplify $\frac{24}{60}$

STEPS:

1. Use the birthday cake method to find the GCF of the numerator and the denominator of the fraction. (The numerator and denominator should be written side by side with the numerator first and the denominator to its right.)

2. The bottom layer of the cake represents the simplified fraction.

3. Rewrite the bottom layer as a fraction and be sure the first number is the numerator and the second is the denominator.

Method 2: Divide and Conquer

Simplify $\frac{24}{60}$

STEPS:

1. Think of a factor that is common to both the numerator and the denominator and divide both by this number.

2. Continue dividing the numerator and denominator by a common factor until they do not have any factors in common.